

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A method of manufacturing a semiconductor device, by use of a perforating process including providing a mask having an opening on a semiconductor substrate, and forming plural types of through-holes different in width dimension in said semiconductor substrate, wherein a removal rate of a semiconductor material in the depth direction of said semiconductor substrate becomes higher as said opening has a wider opening width, said method comprising:

a first step of forming a concave portion in a first surface of a semiconductor substrate, in a first region of said semiconductor substrate corresponding to the opening of said mask having a relatively narrow opening width, to allow said first region to have a thickness dimension less than that of a second, remaining, region of said semiconductor substrate; and

a second step of performing said perforating process using said mask provided on a second, opposite, surface of said semiconductor substrate, to form a first through-hole reaching said first surface in said second region of said semiconductor substrate and a second through-hole reaching said concave portion.

2. (Original) The method according to claim 1, which includes joining said first surface of said semiconductor substrate to a support substrate after said first step, and then performing said second step.

3. (Original) A method of manufacturing a semiconductor device, by use of a perforating process including providing a mask having an opening on a semiconductor substrate, and forming plural types of through-holes different in width dimension in said semiconductor substrate, wherein a removal rate of a semiconductor material in the depth direction of said semiconductor substrate becomes higher as said opening has a wider opening width, said method comprising:

a first step of performing said perforating process using said mask provided on a first surface of a semiconductor substrate until a first through-hole having a relatively wide width dimension reaches a second, opposite, surface of said semiconductor substrate; and

a second step of forming a concave portion in said second surface of said semiconductor substrate, in a region of said semiconductor substrate corresponding to the opening of said mask having a relatively narrow opening width, to allow a second through-hole having a relatively narrow width dimension to penetrate to a bottom surface of said concave portion.

4. (New) A method of manufacturing a semiconductor device, by a perforating process including providing a mask having an opening on a semiconductor substrate, and forming plural types of through-holes different in a width dimension in the semiconductor

substrate, wherein a removal rate of a semiconductor material in the depth direction of the semiconductor substrate becomes higher as the opening has a wider opening width, the method comprising:

forming a concave portion in a first surface of the semiconductor substrate, in a first region of the semiconductor substrate corresponding to the opening of the mask having a width to allow the first region to have a thickness dimension less than that of a second, remaining region of the semiconductor substrate; and

performing the perforating process using the mask provided on a second, opposite, surface of the semiconductor substrate, to form a first through-hole reaching the first surface in the second region of the semiconductor substrate and a second through-hole reaching the concave portion.

5. (New) The method according to claim 1, further comprising joining the first surface of the semiconductor substrate to a support substrate after forming the concave portion in the first surface of the semiconductor substrate, and then performing the perforating process.

6. (New) A method of manufacturing a semiconductor device, by a perforating process including providing a mask having an opening on a semiconductor substrate, and forming plural types of through-holes different in width dimension in the semiconductor substrate, wherein a removal rate of a semiconductor material in the depth direction of the semiconductor substrate becomes higher as the opening has a wider opening width, the method comprising:

performing the perforating process using the mask provided on a first surface of the semiconductor substrate until a first through-hole having a relatively wide width dimension reaches a second, opposite, surface of the semiconductor substrate; and

forming a concave portion in the second surface of the semiconductor substrate, in a region of the semiconductor substrate corresponding to the opening of the mask having a relatively narrow opening width, to allow a second through-hole having a relatively narrow width dimension to penetrate to a bottom surface of the concave portion.